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THE RELATIONSHIP BETWEEN INTERNET ADDICTION AND SLEEP QUALITY AMONG HUMAN SCIENCES UNDERGRADUATES DURING THE COVID-19 PANDEMIC

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ABSTRACT

A cross-sectional study was conducted to investigate the relationship between internet addiction and sleep quality among Human Sciences undergraduates during the COVID-19 pandemic in Malaysia. A group of 36 male (*M*=36) and 132 female (*F*=132) undergraduates, age ranged between 17-29 participated in the study. The Internet Addiction Test (IAT) was used to measure the level of internet addiction while the Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep quality. Using Spearman's rho Correlation Coefficient to analyse the relationship, the study found a statistically significant positive correlation between internet addiction and sleep quality ($rs(166)=.190$, $p=.007$). This indicated that higher level of internet addiction was associated with progressively worse sleep quality. The findings could be useful for psychologists, educational counselors, government, researchers, and students in designing interventions to help students using the internet without the risk of addiction and improve their quality of sleep. Implications, limitations of the study, and suggestions for future research were discussed.

Keywords: *COVID-19, human sciences, internet addiction, sleep quality, Undergraduates.*

INTRODUCTION

In the current era of globalization, an important role in daily life is made simpler because of the bolster of the internet (Rosliza, Ragubathi, MKA, & Shaharuddin, 2018). The internet plays noteworthy roles among the community in many fields, including in social and educational aspects (Machimbarrena, Calvete, González, Bardón, Fernández, & Cabrera, 2018). There has been increasingly high use of the internet in the world, including in Asian countries especially Malaysia (Rosliza, Ragubathi, MKA, & Shaharuddin, 2018). The number of internet users in Asia was 48.4%, and Malaysia was the 10th in the perspective of Internet use (Internet World Stats, 2012, cited in Rosliza et al., 2018). In the year 2014 66.6% of Malaysians were internet users (Malaysian Communications and Multimedia Commission, 2014, cited in Rosliza et al, 2018).

Internet use provides a great number of benefits to the community. It has grown to be an indispensable portion of modern life, bringing tremendous benefits in terms of accessing information precisely and accurately, increasing knowledge with broad insights, facilitating the socialization of humans by means of fast and easy interactions, entertainment, and flexible work (Bener & Bhugra, 2013). In Malaysia, the internet is considered an important communication tool at the time of Movement Control Order

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imposed by the Government during COVID19 pandemic. It was used to inform people about the pandemic and educate them on ways to prevent the spread (Peeri et al., 2020). Nevertheless, the reliance on the internet is not without any negative consequences, one of them is the prevalence of internet addiction. Such is also experienced by undergraduates (Azim, Zam, & Rahman, 2009; Kapahi, Ling, Ramadass, & Abdullah, 2013). Having higher levels of internet addiction risks many groups of users including in the higher education sector (Crawford, Butler-Henderson, Rudolph, Malkawi, Glowatz, Burton, ... & Lam, 2020).

Internet addiction is a common disorder, included in DSM-V (Block, 2008). The misuse of the internet among students, like for scholarly cheating, gambling, and using porn websites, can make undergraduate students become addicted (Zainudin, Din, & Othman, 2013). It has caused alarm among regular internet users, especially among undergraduate students, because addiction, in turn, leads to functional disability of regular activities (Shapira, Lessig, Goldsmith, Szabo, Lazoritz, Gold, & Stein, 2003), including having poor sleep quality (Lam, 2014; Moore & Meltzer, 2008; Zachariae, Lyby, Ritterband, & O'Toole, 2016).

Students with a higher level of internet addiction have higher levels of tiredness which, in turn, lead to poor quality in other aspects of their life, including sleep (Bulck, 2004; Kim, Lau, Cheuk, Kan, Hui, & Griffiths, 2010). During the COVID-19 pandemic lockdown, it was found that 52.4% of young Italian adults indicated having poor sleep quality (Cellini, Canale, Mioni, & Costa, 2020). Durkee, Kaess, Carli, Parzer, Wasserman, Floderus, & Brunner (2012) found that the level of internet addiction in Asian countries is much higher than in European countries, indicative of its prevalence among Asians which merits proper investigations (Cheng, Shih, Lee, Hou, Chen, Chen, & Yang, 2012).

Research that studies the relationship between internet addiction and sleep quality has been found to be conducted among undergraduates of certain academic programmes such as on medical; economics and administration, and law (Bhandari, Neupane, Rijal, Thapa, Mishra, & Poudyal, 2017; Jahan, Hossain, Sayeed, Wahab, Rahman, & Hossain, 2019; Nagori, Vasava, Vala, & Ratnani, 2019; Khayat, Qari, Almutairi, Rambo, Alrogi, Alkhattabi, & Alqarni, 2018). Given that internet addiction is also a phenomenon that risks other groups of undergraduates (Jelenchick, Becker, & Moreno, 2012), such a study should also be conducted on human sciences undergraduates who form a good number of the undergraduate population in universities.

Several studies had been conducted on sleep quality among undergraduates, for instance by Nurismadiana and Lee (2018) who reported that 70.6% of undergraduates in Malaysia experience poor sleep quality. The studies, however, did not associate it with internet addiction. Besides that, though there were studies on internet addiction among non-medical undergraduates in Malaysia (Azim, Zam, & Rahman, 2009), the study did not investigate the relationship between internet addiction with sleep quality. Thus, this research aimed to study the relationship between internet addiction and sleep quality among human sciences undergraduates during the COVID-19 Pandemic in Malaysia. The findings are expected to provide scientific evidence in enriching the existing literature on the relationship between internet addiction and sleep quality. The findings could help policymakers and professionals design interventions to assist undergraduates in dealing with their internet addiction and sleep quality. The findings could provide baseline

information for public health officials, medical practitioners (Peeri et al., 2020), researchers, educational institutions, governments in efforts to develop programmes that tackle the emergence of negative effects of internet addiction, especially the sleep quality.

Internet addiction refers to an individuals' inability to control themselves when using the internet, and in turn, experience functional impairment of daily activity, and feelings of distress (Shapira et al., 2003). It is associated with the frequent need for seeking pleasure and the inability to detach self from something (Simsek & Sali, 2014). It is a social problem parallel to social isolation, cravings and withdrawal symptoms, loss of control, academic failure, excessive financial debt, and job termination (Young, 1998).

Internet use among college or undergraduate students seemingly has no time and space restrictions. Besides escalating the risk of having internet addiction, its use has posed an increment of dangers on the users (McKenna & Bargh, 2000), including sleep quality. Research by Yang et al., (2019) showed a relationship between prolonged sleep latency as the one of elements of sleep quality with internet addiction, this is due to the high prevalence of internet access through smartphones or tablets and computers among students. Moreover, delayed sleep latency was shown to come from partaking in online games and watching action movies before sleep that resulted in the stimulation of the central nervous system (Higuchi, Motohashi, Liu, & Maeda, 2005). This fact is in line with the reason students use the internet for social activities and entertainment, including for watching movies, social media, and online games (Lin, Lee, Chen, Hsieh, & Yang, 2019).

Another conceivable clarification is the prolongation of sleep latency caused by the suppression of melatonin secretion from the pineal gland from the emission of blue light through the screens, which can impact the sleep quality (Moderie, Van der Maren, and Dumont, 2017). Hence, from all the consequences, it can be concluded that internet addiction can worsen the quality of sleep and one's condition, attributable to the availability of the programmes and the utilization of diverse technologies.

The theoretical framework proposed by Herlache, Lang, and Krizan (2018) was utilized as the research's theoretical model. The model covers key aspects such as withdrawal, volatility, daily disturbance in association with sleep efficiency.

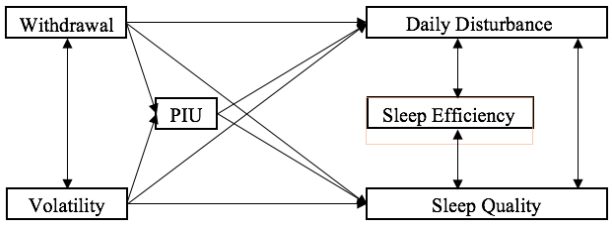

Figure 1. [Path analysis between internet addiction and sleep quality (Herlache, Lang, & Krizan, 2018) as a theoretical framework.]

Based on the theory, the following conceptual framework was formulated (Figure 2). to explain the relationship between Internet Addiction and Sleep Quality among Human Sciences undergraduates in Malaysia. The following hypothesis was formulated the current research, as follow:

H1: It was hypothesized that there was a positive relationship between internet addiction and sleep quality among Human Sciences undergraduates.

H2: It was hypothesized that the higher level of internet addiction, the greater score of sleep quality.

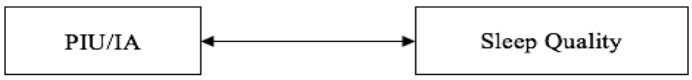

Figure 2: Relationship between Internet Addiction and Sleep Quality.

Research Method

Participants

The sample consisted of 168 (*N*=168) human sciences undergraduates from various universities in Malaysia. They specialize in Psychology, Communications, English Language and Literature, Political Science, Sociology and Anthropology, as well as History and Civilization. This sample size was estimated from G-Power software (3.1.0). The 138 subjects were needed after the condition of a type I error 0.05 to a power of 0.95 estimated. Therefore, 150 participants indicated as the proportional number for this research. They were students from various levels of year and nationalities who were studying in Malaysia, with the age ranged from 17 to 29 years old. They were recruited for an online survey through a convenient sampling technique.

Design

This research was conducted using a cross-sectional research design and correlational studies, to measure the relationship between internet addiction and sleep quality.

Materials or Instruments

The level of internet addiction was measured using the Internet Addiction Test (IAT—the higher the score, the higher the addiction level of the internet (Young, 1998). IAT consists of 20 items with five-point rating scales (1=" never," 5= "always"). It measures the severity of internet addiction from weak if the average score is between 20-49 points, moderate if the score between 50-79, and severe for 80-100 (Young, 1998). The lowest score is 20 and the highest score is 100 (Young, 1998). The higher the score indicated, the more addicted to the internet. Moreover, it generated six-component scores. This scale already covers the degree of sleeping patterns such as, “How often do you lose sleep due to late-night log-ins?”. Its Cronbach’s Alpha (0.54–0.82) shows its high coefficient of internal consistency (Widyanto & McMurran, 2004).

The level of sleep quality was measured by 19 items from Pittsburgh Sleep Quality Index (PSQI) by (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). It assesses seven components, such as subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep-promoting medications, and daytime dysfunction (Buysse, Reynolds, Monk, Berman & Kupfer, 1989). One of the questions from the questioner was “During the past month, how would you rate your sleep quality overall.” Each item has a range of 0-3 point rating scales. A total score, if greater than 5, correlates to worse sleep quality or indicates poor sleep quality. Hence, a score of >5 is classified as sleep disturbance (Buysse, Reynolds, Monk, Berman & Kupfer, 1989). The

reliability coefficient was 0.83 (Cronbach's alpha). The validity is PSQI highly valid with adults around the world (Grandner, Kripke, Yoon, & Youngstedt, 2006).

Data Collection Procedures

The online data collection was conducted from 22 March 2020 until 18 April 2020. Participants have been recruited of their own accord without coercion. Written informed consent was also attached beforehand. They had been given the right to withdraw whenever they wanted. The demographic form did not ask the participants' names to establish their privacy. A copy of the demographic form had been given to every single participant who was assigned in this survey as their right.

Through WhatsApp groups and Instagram, the online questionnaire was successfully distributed during the COVID-19 pandemic, when the lockdown system was implemented by the Malaysian Government. The survey was conducted online using the English version of the questionnaire. Participants must answer the survey sequentially, none of the questions were unanswered or skipped. This was to ensure they answer all survey questions, without any blank. It took around 8 until 15 minutes. All participants were required to fill in their email addresses, then filtration was processed in Ms. Excel to eliminate the same email address. This was to avoid multiple responses from a respondent.

Data Analysis Procedures

For data analysis, SPSS 22.0, the statistical package SPSS 1.0.0.1347, and Microsoft Excel was utilized. Spearman's rho Correlation Coefficient was utilized to analyze the relationships between the two variables. The histogram and Kolmogorov-Smirnov test were used to check the normality distribution of Independent and Dependent Variable. A Kolmogorov-Smirnov test indicated that both variables did not follow a normal distribution, $D(168) = 0.044$, $p = 0.200$. The result of Internet Addiction was normally distributed, and for Sleep Quality, $D(168) = -.132$, $p = 0.000$ which was not normally distributed. For the Linearity test, based on ANOVA Output, the value sig. Deviation from Linearity of 0.095> 0.05 it can be concluded that there was a linear relationship between the variables of internet addiction and sleep quality. Hence, Spearman's rho Correlation Coefficient was utilized. Moreover, the reliability test performed through the Cronbach alpha reliability coefficient to be evaluated. Categorized significance at $p<0.05$. In addition, the suitability of the variables to normal distribution was evaluated by the Kolmogorov Smirnov test, histograms, and Q-Q graphs. Descriptive statistical methods, which were mean, standard deviation, frequency, percentage, also the relationship between quantitative data were used in this research.

RESULT AND DISCUSSION

It was found that (13%) of the participants reported an average level of internet use; 82% had frequent problems, and 5% had a high level of internet addiction. 12% of the participants had good sleep quality and the rest (88%) had poor sleep quality.

Table 1
The level of Internet addiction and sleep quality

	N	Minimum	Maximum	*M*	*SD*
Total IAT	168	24	100	61.02	11.572
Total PSQI	168	1	19	7.98	3.200
Valid N (listwise)	168				

Table 1 shows the Internet Addiction Test scores for 168 participants (*N*=168), ranging from 24 to 100 (*M*=61.02, *SD*=11.572). It shows that the participants had frequent problems due to internet use or were moderately addicted to the Internet. It also shows the total Pittsburgh Sleep Quality Index of the participants which range from 1 to 19 (*M*=7.98, *SD*=3.200) which indicated poor sleep quality.

Table 2
Spearman's rho correlation for the relationship between internet addiction and sleep quality

			Total PSQI	Total IAT
Spearman's rho	Total PSQI	Correlation Coefficient	1.000	.190**
		Sig. (1-tailed)	.	.007
		N	168	168
	Total IAT	Correlation Coefficient	.190**	1.000
		Sig. (1-tailed)	.007	
		N	168	168

**. Correlation is significant at the 0.01 level (1-tailed).

A Spearman's rank-order correlation was performed to test the relationship between 168 Human Sciences Undergraduates' internet addiction and sleep quality levels. The results showed that internet addiction and sleep quality scores were statistically significantly correlated, ($rs(166)= .190$, $p<.05$) one-tailed. This result suggests that there was a weak and significant positive correlation between internet addiction and sleep quality scores. As internet addiction scores go up, so do the sleep quality scores. Specifically, when the sleep quality's score is high. the poorer the quality of sleep a person experiences. Thus, it indicated that higher levels of internet addiction are associated with progressively worse global sleep quality among Human Sciences Undergraduates and vice versa.

The relationship between internet addiction and sleep quality

The current research found that internet addiction's level is associated with the quality of sleep. Participants with a high level of internet addiction scored higher in their sleep quality score and vice versa. High sleep quality scores in their PSQI scale indicated poor sleep quality. It can be concluded that the first and second hypothesis were accepted and that this correlational model is in line with those hypotheses. These are in line with the findings by other researchers such as Jahan et al. (2019), Kootesh, Raisi, and Ziapour (2016), Ayran, Gundogdu, and Işık (2019) who had found that internet addiction was positively correlated with poor sleep quality among undergraduates.

Internet addiction

This current study has found 82% had frequent problems and 5% had significant problems in Internet Addiction which the total was 87% experienced internet addiction,

consistent with a previous study that indicated 74% of Malaysia human sciences undergraduates experienced internet addiction (Azim, Zam, & Rahman, 2009). It was observed that from 2009 to 2020 there was a 13% increment of the level of internet addiction among them.

Sleep quality

It was found that 88% of the participants had poor sleep quality, a finding similar to an interventional study conducted among many undergraduate students in public universities in Malaysia from different faculties, where 70.6% of their participants reported having poor sleep quality (Nurismadiana & Lee, 2018). However, the results in this research were much higher compared to the prevalence of poor sleep quality in some previous research conducted among Malaysian undergraduates. For instance, students had poor sleep quality with scores of only 35.5% (Zailinawati et al., 2009) and 32.9% (Lai & Say, 2013). The findings were also consistent with other researches among undergraduate samples in different faculties and countries which indicated that poor sleep quality was common among them, such as 54.5% in Saudi Arabia (Khayat et al., 2018); Taiwan (54.5%) (Lin et al., 2019); Lebanon (58,7%) (Kabrita, Hajjar-Muça, & Duffy, 2014); and Bangladesh (69.5%) (Jahan et al., 2019).

Internet addiction and sleep quality

The strengths of this research were in determining the proportion of internet addiction and sleep quality among the Human Sciences Undergraduates during the COVID-19 pandemic in Malaysia. Other research conducted in Malaysia was limited by the fact that those prior researchers only assessed the prevalence of internet addiction and sleep quality separately, without any correlation measured. Furthermore, no other research considered the COVID-19 pandemic in their research in consideration of the relationship between internet addiction and sleep quality. Validity of the research was ensured as according to Jahan et al. (2019), the Pittsburgh Sleep Quality Index was utilized for the online survey which was a validated questionnaire to determine the severity of the sleep quality objectively. Furthermore, this research can bring about benefits to the community, such as building public awareness, providing timely interventions to avoid addiction to the Internet, and improving poor sleep quality.

Despite the strengths, several limitations exist. Firstly, even though PSQI was frequently used among many researchers, due to the concept of self-report, social desirability bias may exist which may influence the data accuracy of the present research as it may give low objective evidence. Secondly, the sample size may not be adequate as participants were recruited from two universities within Malaysia. Thirdly, the present research excluded participants who were not from the Human Science department. Future research is encouraged to include participants from other departments as subjects. In addition, the period of study for the current research was in the middle of lockdown and Covid-19 pandemic, therefore the results of the study may be heavily influenced by the pandemic and not reflect the participants' status of internet addiction that may affect the quality of sleep during long holidays, non-lockdown, and non-pandemic circumstances. Finally, it was acknowledged that the establishment of any cause-and-effects relationships among the research parameters was not elucidated due to the cross-sectional design being implemented for this research. Hence, further research is needed to explore other aspects regarding the level of internet addiction and sleep quality to obtain more

detailed scientific knowledge, as well as to explore and address the high level of internet addiction and poor sleep quality following nationwide epidemics.

CONCLUSION

Findings in this study are in convergence with the previous researches, showing: 1) a positive correlation between internet addiction and sleep quality, 2) the higher level of internet addiction, the lower level of sleep quality a person. This finding provides insights on how the higher level of internet addiction amongst Human Sciences undergraduates in Malaysia can increase poor sleep quality significantly. In brief, individuals are suggested to lower their level of addiction towards using the internet by implementing self-control in it. Also, they can actively have good sleep quality for their coping strategies in daily life to achieve a better quality of life and wellbeing. Because efforts to prevent undergraduates who have high levels of internet addiction with poor sleep quality are better than cure it. Certain steps should be prepared to prevent Internet addiction and poor sleep quality, especially in the pandemic. On top of that, researchers should further examine the effects of internet addiction on one's sleep quality with respect to the educational institute such as various faculties, age range, and financial status. As for undergraduate students, different academic, financial backgrounds, and ages can produce different findings.

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